

# PATENT SPECIFICATION



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## PROVISIONAL SPECIFICATION.

### Improvements in the Manufacture of Cam Mechanism.

We, DOUGLAS MOTORS LIMITED, a British company, of Douglas Works, Hanham Road, Kingswood, Bristol, Gloucestershire, and CYRIL GEORGE PULLIN, a British subject, of "Park View", Staple Hill, Bristol, aforesaid, do hereby declare the nature of this invention to be as follows:—

This invention relates to the manufacture of cam mechanism, especially that employed for the valve gear of internal combustion engines. In certain types of engines, for example, the flat twin type, a pair of exactly similar cams spaced apart sideways in accordance with the offset of the two cylinders, are located one on each side of a timing gear wheel. The manufacture of a part of this kind involves considerable time and cost which it is the object of this invention to avoid, whilst producing a result which will possess a high degree of accuracy.

According to this invention, the hub or disc of the gear wheel is perforated in accordance with the shape of the cam, and the latter is made of uniform section from end to end and is engaged with the gear wheel by a press fit, shrinking-on, or other suitable means.

In one method of carrying out the invention, the cams are formed from bars, initially manufactured to the required cross section and thereafter cut or otherwise parted off in the required lengths. These are hardened and, if

necessary, finish-ground, an axial hole being provided for mounting on a fixed spindle.

The gear wheel, which preferably is of disc form, is perforated by any appropriate means so that the hole will form a press or shrink fit (as the case may be) on the cam, and it is then fixed accordingly upon it, so that a finished cam is provided on each side of the gear wheel.

If preferred, additional security of fixture may be obtained by the use of a pin or feather, but in general the press or shrink fit is perfectly reliable.

The invention provides the following advantages:—Reduced time and cost of manufacture, a high degree of accuracy and a very secure fit in the direction of the drive. Also worn cams can be replaced without scrapping the gear, or the converse.

The cam, when mounted on the engine, is prevented from axial movement and even if the gear upon it became loose sideways it would still be retained in position by the push rods, particularly if the latter were provided with laterally extending pads at their acting ends.

Dated this 26th day of May, 1925.

ERIC W. WALFORD,  
Fellow of the Chartered Institute of  
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Agent for the Applicants.

## COMPLETE SPECIFICATION.

### Improvements in the Manufacture of Cam Mechanism.

We, DOUGLAS MOTORS LIMITED, a British company, of Douglas Works, Hanham Road, Kingswood, Bristol, Gloucestershire, and CYRIL GEORGE PULLIN, a British subject, of "Park View", Staple Hill, Bristol, aforesaid, [Price 1/-]

do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- 5 This invention relates to the manufacture of cam mechanism for the valve gear of internal combustion engines. In certain types of engines, for example, the  
10 flat twin type, a pair of exactly similar cams spaced apart sideways in accordance with the offset of the two cylinders, are located one on each side of a timing gear wheel. The manufacture  
15 of a part of this kind involves considerable time and cost which it is the object of this invention to avoid, whilst producing a result which will possess a high degree of accuracy.
- 20 According to this invention, the hub or disc of the wheel is perforated in accordance with the shape of the cam, and the latter is made of uniform section from end to end and is engaged with the  
25 gear wheel by a press fit, shrinking-on, or other suitable means.

In the accompanying drawings,

Figure 1 shows in side elevation the cam and wheel separated, and

- 30 Figure 2 shows them united.

Like numerals indicate like parts throughout the drawings.

- The cams are preferably formed from long bars, initially manufactured to the  
35 required cross section, cut or otherwise parted off in the required lengths such as 2, Figure 1. These are hardened and, if necessary, finish-ground, an axial hole 3 being provided for mounting on a fixed  
40 spindle. If desired, dogs 4 may be formed for driving an accessory.

- The gear wheel 5, which preferably is of disc form, is perforated at 6 by any appropriate means so that the hole will  
45 form a press or shrink fit (as the case may be) on the cam length 2, and it is then fixed accordingly upon it, so that a

finished cam is provided on each side of the gear wheel, see Figure 2. Where a single cam alone is required it could project on one side only. 50

If preferred, additional security of fixture may be obtained by the use of a pin or feather, but, in general, the press or shrink fit is perfectly reliable. 55

The invention provides the following advantages:—Reduced time and cost of manufacture, a high degree of accuracy and a very secure fit in the direction of the drive. Also worn cams can be replaced without scrapping the wheel, or the converse. 60

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:— 65

1. In cam mechanism for the valve gear of an internal combustion engine, the combination with a wheel having a hole which is the shape of the cam, of a piece of bar of a section to fit the hole, which is fixed therein and projects laterally therefrom. 70

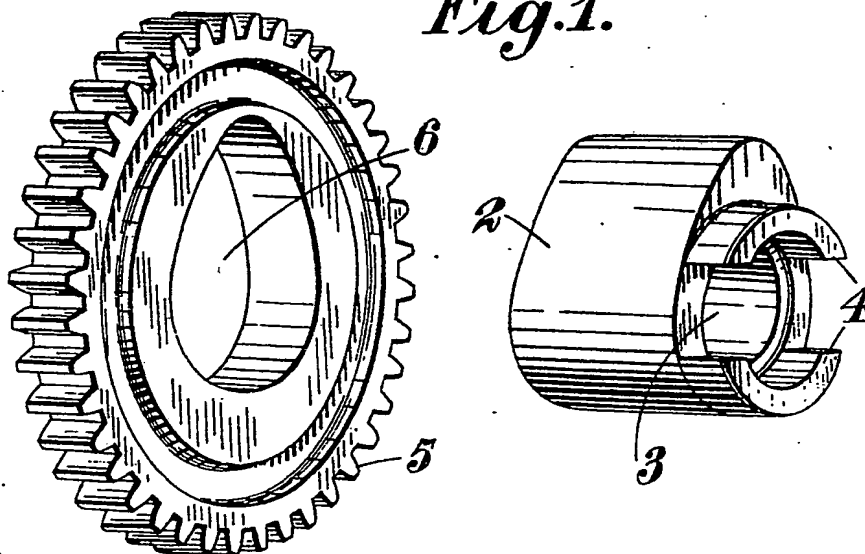
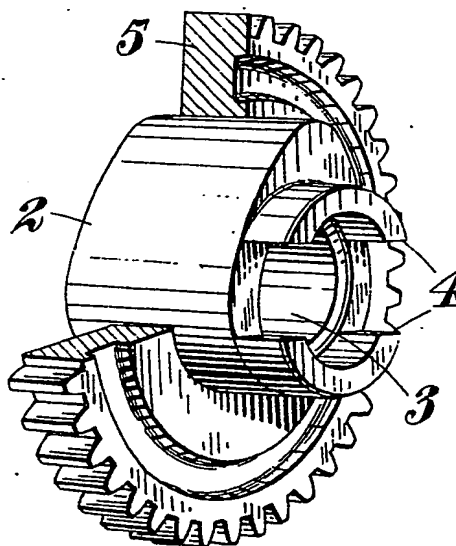
2. Cam mechanism as claimed in Claim 1, wherein the bar projects on both sides of the wheel, substantially as and for the purpose described. 75

3. Cam mechanism as claimed in either of the preceding claims, in which the bar is bored and adapted to rotate on a fixed shaft, substantially as described. 80

4. The complete combined cam and wheel, substantially as described or illustrated in the accompanying drawings. 85

Dated this 2nd day of February, 1926.

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Agent for the Applicants. 90

*Fig.1.**Fig.2.*

*[This Drawing is a reproduction of the Original on a reduced scale.]*

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